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(54) Title: INTEGRATED FLUID MANIPULATION CARTRIDGE

## (57) Abstract

A cartridge (101) for separating a desired analyte from a fluid sample includes a sample port (103) and a sample flow path extending from the port through the body of the cartridge. The sample flow path includes at least one flow-through component (122), e.g., filter paper or a microfabricated chip, for capturing the desired analyte from the sample as the sample flows through the cartridge. The cartridge also includes an elution flow path for carrying elution fluid through the component (122) to release captured analyte from the component into the elution fluid. The elution flow path diverges from the sample flow path after passing through the component (122). Flow controllers (41A and 41B) direct the remaining fluid sample into a waste chamber (139) after the sample flows through the component (122) and direct the elution fluid and eluted analyte into a reagent chamber (141) and reaction chamber (143). The continuous-flow design of the cartridge permits the rapid processing of a fluid sample that is larger in volume than any interactive region within the cartridge, allowing increased sensitivity in the detection of low copy concentrations of analytes, such as nucleic acid.

